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TR-01-167

4140
Anthropometry
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NTIS/PS-78/0866

Anthropometry: Basic Studies and Applications
Volume 2. 1976 - July 1978

A Bibliography with Abstracts

Search period covered

1976 - July 1978

NTIS

U.S. DEPARTMENT OF COMMERCE
National Technical Information Service
Springfield, Va. 22161

20100715184

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Sample Citation from the NTIS Data Base

Compilation of State Data for Eight Selected Toxic Substances, Volume I	Title
Mitre Corp., McLean, VA. *Environmental Protection Agency, Washington, D.C. Office of Toxic Substances. (402-364)	Corporate Author Sponsoring Agency
Final rept. AUTHOR: Roberts, Elizabeth, Spewak, R., Stryker, S., Tracey, S.	
CS945F4 FLD: 06T 06F 57Y*, 57H, 68* USGRDR7606 Sep 75 165p*	NTIS Subject Categories Pages in Report Report Date
REPT NO: MITRE-75-52-Vol-I CONTRACT: EPA-68-01 2933 MONITOR: EPA/560/7-75/001-I Paper copy also available in set of 5 reports as PB-248 649-SET, PCS36.00 ABSTRACT: In June 1974, toxic substances data in the U.S. were collected and analyzed in 20 key states. This report describes that effort and discusses the amount, type and usefulness of the data and toxic substances monitoring capabilities of the state agencies contracted.	
DESCRIPTORS: *Environmental surveys, States (United States), Monitors, Toxicology, Arsenic, Beryllium, Cadmium, Cyanides, Lead (Metal), Mercury (Metal), Chlorine aromatic compounds, Data acquisition, Data processing, Water pollution, Air pollution, Chemical compounds	
IDENTIFIERS: *Toxic agents, Biphenyl/chloro, State agencies, NTISEPOATS	Order Number
PB-248 660/3ST NTIS Prices: PC A08/MF A01	Microfiche Price Code Paper Copy Price code
Keywords	

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Comparative Anthropometry of Air Standardization Coordinating
Committee Personnel for Equipment Design: Helmets

Webb Associates Inc Yellow Springs Ohio (401286)

Technical rept.

AUTHOR: McConville, John T.; Clauser, Charles e.

E1422F3 Fld: 5E, 6Q, 95D GFAI7815

Nov 77 17p

Contract: F33615-76-C-5007

Project: 7184

Task: 08

Monitor: AMRI-TF-77-77

Abstract: The objective of this report is to demonstrate that the comparability of body-size distributions of aircrew personnel of Air Standardization Coordinating Committee (ASCC) member nations is such that protective equipment sized and designed to fit personnel of one member nation will fit personnel of all member nations as well. The research reported on in this publication compares the available anthropometry of the head and face of member ASCC nations, demonstrates their similarities, and tests the theoretical suitability of a Royal Aircraft Establishment (RAE) sizing program for helmets to accommodate U.S. Air Force (USAF) personnel. (Author)

Descriptors: *Anthropometry, *Helmets, Flight clothing, Standardization, Military forces(Foreign), Military forces(United States), Flight crews, Head(Anatomy), Sizes(Dimensions)

Identifiers: Protective clothing, Comparison, Design, NTISDCDXA

AD-AC52 893/5ST NTIS Prices: PC A02/MF A01

Portable Seating Apparatus

Department of the Navy Washington D C (110050)

Patent

AUTHOR: Peters, Peter A. C.

E1311B3 Fld: 5E, 95D, 90 GRAI7814

Filed 4 Oct 76, patented 13 Dec 77 5p

Rept No: PAT-APPL-729 049, PATENT-4 062 605

Monitor: 18

Supersedes PAT-APPL-729 049-76, AD-D003 273.

Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 \$0.50.

Abstract: An object of the invention is to provide a new and improved portable seating bench provided with an adjustable foot support. Another object of the invention is to provide a new and improved seating bench which may be employed to standardize anthropometric measurements of seated subjects at different locations. Another object is to provide a new and improved means for suitably positioning subjects of anthropometric measurements.

Descriptors: *Patents, *Seats, *Portable equipment, Anthropometry, Measuring instruments

Identifiers: PAT-CL-312-235, Human factors engineering, NTISGEN

AD-D004 754/8ST NTIS prices: Not available NTIS

Relationship of Anthropometric Measurements to Body Fat as Determined
by Densitometry Potassium-40, and Body Water

Letterman Army Inst of Research San Francisco Calif (404912)

Final rept.

AUTHOR: Ward, Gerald M.; Krzywicki, Harry J.; Rahman, Donald E.;
Quaas, Richard L.; Nelson, Richard A.
E114161 Fld: 6C, 57A GRAI7813

1975 10p

Rept No: LAIR-75-059

Project: 3A161102E71R

Task: 02

Monitor: 18

Availability: Pub. in The American Jnl. of Clinical Nutrition, v28 n2
p162-169 Feb 75.

Abstract: A variety of anthropometric measurements were made on 223 male and 36 female military personnel for whom total body fat was estimated by density, K40 counting and D2O dilution. Simple correlations with body fat estimates indicated that for the male population, waist, weight and buttocks circumferences were most highly correlated with fat estimate ($r=0.70$ to 0.85). In the female population skinfold thicknesses were the measurement most highly correlated with weight of body fat ($r=0.66$ to 0.87). Stepwise multiple regression analysis showed that five of the variables could account for 60-70% of the variation in fat in males and up to 90% in females. Correlations of measurements were higher with fat as estimated by density than with estimates derived from potassium-40 counting or D2O dilution in males. (Author)

Descriptors: *Anthropometry, Males, Females, Military personnel, Skin (Anatomy), Thickness, Human body, Fats, Density, Distribution, Correlation techniques, Body fluids, Regression analysis, Deuterium compounds, Water, Potassium, Reprints

Identifiers: *Body fat, Skinfold thickness, Potassium 40, *Body fat, NTISICDXR

AD-A051 663/3ST NTIS Prices: PC A02/MF A01

Radiographic and Biomechanical Studies of the Human Spine

Vermont Univ Burlington Dept of Orthopaedic Surgery (410566)

Final rept. Jul 74-Sep 77

AUTHOR: Pope, M. H.; Wilder, D. G.; Buturla, E.; Matteri, E.; Frymoyer, W. W.

E0854F1 Fld: 6E, 5E, 57A, 95C, 95D GRAI7810

1 Oct 77 161p

Grant: AFCSF-74-2738

Project: 2312

Task: A2

Monitor: AFCSF-TF-78-0063

Abstract: The techniques and equipment to take biplane and stereo roentgenographs of the spine and pelvis in various positions of flexion-extension, lateral bend and axial rotation are explained. The in vivo load-deflection characteristics are given both for the whole spine and for individual motion segments. Moire fringe topography for the back is introduced and results given. Application of these techniques to USAF ejection seats, the MAST suit and clinical measures of disc space height and rotation are reported. Measurements of the pelvis of various racial groups are reported. There is discussion of interactions between the pelvis and the spine. (Author)

Descriptors: *Spinal column, *Radiography, *Biomechanics, Humans, Stereophotography, Moire effects, Pelvis, Bones, Load distribution, Positioning reactions, Disks, Rotation, Anthropometry, Race (Anthropology), Ejection seats, Flight clothing, Pressure suits, Flight crews, Biodynamics, Mathematical models, Algorithms, Diagnosis (Medicine), Orthopedics

Identifiers: Intervertebral disks, Vertebrae, NTISDODXA

AD-A049 984/EST NTIS Prices: PC A08/MF A01

Relative Structural Considerations for Protection from Injury and Fatality at Various Overpressures

IIT Research Inst Chicago Ill (175350)

Final rept. 17 Jun 75-18 May 77

AUTHOR: Longinow, A.; Wiedermann, A.

EC663F1 Fld: 6U, 15F, 91I, 74H GRAI7808

Jun 77 133p

Rept No: IITRI-J6365

Contract: DCPA01-75-C-0325

Monitor: 18

Abstract: This report contains the results of a study concerned with producing casualty (injury and fatality) relationships for people located in conventional buildings when subjected to the direct effects produced by nuclear weapons. People survivability estimates for people located in conventional basements of multistory buildings subjected to blast effects of megaton range nuclear weapons are presented. Results are for full basements with two-way reinforced concrete overhead floor systems supported on steel beams. The transient velocity field that may exist in such basements is modeled and used to determine the response of individuals located within. Two models having different levels of sophistication are used to simulate individuals. Results are used in part to gauge the adequacy of the simpler model. The more sophisticated model is subsequently used to examine two closely related problems. The first considers the influence of anthropometric variation of individuals on the general nature of the blast translation problem (in the tumbling mode) and the severity of the resulting impact with floor and walls. The second examines the tumbling characteristics of individuals in a series of representative flow environments.

Descriptors: *Nuclear warfare casualties, *Wounds and injuries, *Blast waves, *Overpressure, Survival(Personnel), Buildings, Structural response, Blast loads, Fallout shelters, Civil defense, Anthropometry, Mathematical analysis

Identifiers: NTIS/DXA

AD-A049 040/95T NTIS Prices: PC A07/MF A01

Anthropometry of Women of the U. S. Army--1977. Report Number 1.
Methodology and Survey Plan

Webb Associates Inc Yellow Springs Ohio (401286)

Technical rept.

AUTHOR: Laubach, Lloyd L.; McConville, John T.; Churchill, Edmund;
White, Robert M.

D3432D4 Fld: 5E, 95D GRAI7723

Jun 77 201p

Contract: DAAG17-76-C-0010

Project: 1L762723AH98AC

Task: 003

Monitor: CE/MEL-172

Abstract: An anthropometric survey of U. S. Army women was conducted during the winter of 1976-1977--the first such survey in 30 years. The survey was planned and carried out in response to the need for current and comprehensive body size and strength data for the women who make up an increasingly large part of the U. S. Army. The main purpose of the survey was to obtain and develop statistical data on body size, workspace parameters, and static muscle strength of U. S. Army women. During the survey, data were obtained on 128 conventional body size dimensions, 14 workspace dimensions, and 9 static strength measurements. Many of the measurements made had not been previously reported for any large-scale survey of women, military or civilian. Other measurements were selected to supplement and complement data already available to provide up-to-date information for use in the design of clothing, protective equipment, workspace and industrial equipment which women in the Army wear, use, operate, or within which they work. This, the first of a series of reports dealing with this survey, describes the methodology used in the conduct of the survey. Included here are an outline of the survey design, a listing of the landmarks used in defining the dimensions to be measured and detailed descriptions of the procedures used in making each measurement. Measurement techniques used in previous large-scale anthropometric surveys of women also are listed here. Thus this report, in addition to reporting the methodology of the present survey, constitutes a comprehensive source book of anthropometric techniques for use with women. (Author)

Descriptors: *Anthropometry, *Females, *Army personnel, *Surveys, Measurement, Methodology, Sizes(Dimensions), Human factors engineering, Strength(Physiology)

Identifiers: NTISLDDXA

AD-A043 715/2ST NTIS Prices: FC A10/MF A01

Anthropometry of Women of the U.S. Army -- 1977. Report Number 2. The Basic Univariante Statistics

Webb Associates Inc Yellow Springs Ohio (401286)

Technical rept.

AUTHOR: Churchill, Edmund; Churchill, Thomas; McConville, John T.; White, Robert M.

D3685D4 Fld: SE, 95E GRAI7725

Jun 77 276p

Contract: DAAG17-76-C-0010

Project: 1L762723AH98

Task: AC

Monitor: CE/MEL-173

See also Report Number 1, AD-A043 715.

Abstract: This report, the second in a series, summarizes the univariate statistics obtained in an anthropometric survey of women in the U.S. Army conducted at Fort Sam Houston, Texas; Fort McClellan, Alabama; Walter Reed Medical Center, the District of Columbia; and Fort Jackson, South Carolina, during the winter of 1976-1977. This survey, carried out to satisfy the need by the U.S. Army for up-to-date data on the body sizes and strength capabilities of the women who now constitute a substantial portion of its personnel, represents the first major anthropometric survey of Army women since 1946. Data for 69 body size measurements were obtained on a sample of 1,331 women who covered wide ranges of age, rank, and military assignment. Additional data were obtained on subseries of between 200 and 300 women for: (a) other standard body size measurements, (b) workspace measurements, (c) head and face measurements, and (d) static strength measurements. Summary statistics and frequency distributions are given here for all these measurements, plus age. Full descriptions of the measurement techniques and the design and conduct of the survey have already appeared in the first of this series of reports. Brief definitions, illustrations of measurements, and outlines of the computational and statistical procedures used in preparing this report are included here. (Author)

Descriptors: *Females, *Army personnel, *Anthropometry, Statistical data, Tables(Data), Statistical distributions, Strength(Physiology), Head(Anatomy), Face(Anatomy), Arms(Anatomy), Legs, Hands, Feet, Measurement, Sizes(Dimensions)

Identifiers: Age distribution, Race distribution, Univariate statistics, NTISDODXA

AD-A044 806/8ST NTIS Prices: PC A13/MF A01

Anthropometry of Women of the U.S. Army--1977. Report Number 3.
Bivariate Frequency Tables

Webb Associates Inc Yellow Springs Ohio (401286)

Technical rept.

AUTHOR: Churchill, Thomas; Churchill, Edmund; McConville, John T.;
White, Robert M.

70223K2 Fld: 6N, 5E, 95D GRAI7803

Jul 77 351p

Contract: DAAG17-76-C-0010

Project: 1L762723AH98

Task: AC

Monitor: CE/MEL-174

See also Report no. 1, AD-A043 715.

Abstract: In this report, the third in a series, over 300 bivariate frequency tables, based on the data from the 1976-1977 anthropometric survey of U.S. Army women, are presented to facilitate the use of these data by designers of clothing, equipment, and workspaces which Army women will wear or use. A substantial number of these tables are similar to tables included in the reports of the 1946 survey of Army women. Some basic tables are presented in both metric and English or inch units. (Author)

Descriptors: *Anthropometry, *Females, *Army personnel, *Bivariate analysis, Tables(Data), Statistical analysis, Standard deviation, Measurement, Clothing, Surveys, Sampling, Human factors engineering

Identifiers: NTISIODXA

AD-A046 692/0ST NTIS Prices: EC A16/MF A01

Anthropometry of Women of the U.S. Army--1977. Report Number 5.
Comparative Data for U.S. Army Men

Webb Associates Inc Yellow Springs Ohio (401286)

Technical rept.

AUTHOR: McConville, John T.; Churchill, Edmund; Churchill, Thomas;
White, Robert M.

E0572G2 Fld: 5E, 95D GRAI7807

Jul 77 238p

Contract: DAAG17-76-C-0010

Project: 1L762723AH98

Task: AC

Monitor: NATICK-TF-77/029

See also report dated Jun 77, AI-A043 715.

Abstract: This report, one in a series which deals with the results of an anthropometric survey of 1331 U.S. Army women, presents comparable data resulting from the measurement of 287 Army men. The opportunity to secure measurements on male subjects made by the same technicians at the same time and place, and using precisely the same measuring techniques, provided a unique source of comparative data for the design of Army clothing, equipment, and workspaces which, increasingly, must accommodate the wide range of sizes represented by both sexes. The subjects in the men's survey represented a homogeneous group, chiefly trainees with a median age of about 19 years. The sample was composed of approximately two-thirds Whites, one-third Blacks, and a small fraction of Orientals. This report describes the conduct of the survey on men and includes the univariate summary statistics and frequency tables resulting from it. Data obtained in the survey included 44 of the 69 body size measurements made on Army women and 13 of an additional 24 standard body dimensions measured on the women, as well as three identical subseries of workspace, head and face, and static strength measurements. Also provided are 51 selected bivariate frequency tables.

Descriptors: *Anthropometry, *Army personnel, *Females, Males, Comparison, Statistical data, Clothing, Army equipment, Human factors engineering, Strength(Physiology), Trainees, Human body, Sizes(Dimensions), Range(Extremes), Tables(Data), Statistical distributions

Identifiers: *Women, NTISDODXA

AD-A048 591/2ST NTIS Prices: PC A11/MF A01

Selected Design Parameters for Reclining Seats Based on Engineering Anthropometry

Texas Tech Univ Lubbock Dept of Industrial Engineering (400785)

Final rept.

AUTHOR: Ayoub, M. M.; Deivanayagam, S.; Kennedy, Kenneth W.

E0564J1 Pld: 5E, 1C, 85A, 95E GRAI78C7

Sep 77 162p

Contract: F33615-75-C-5013

Project: 7184

Task: 08

Monitor: AMRI-TR-77-44

Abstract: This report discusses selected engineering anthropometric design criteria for reclining cockpit seats. The reclining back-rest positions selected were 13, 27, 51 and 65 deg from the vertical line through the seat reference point (SRP). Two seat pan angles of 10 and 20 deg were utilized. Three seating components were considered in this report, these are: the head rest, arm rest, and foot rest. The specific engineering anthropometric design parameters addressed were: the head rest hinge point location, arm rest location and orientation in space as the seat reclines, location of foot rests and the synchronization of arm rest movement with back rest inclination. (Author)

Descriptors: *Human factors engineering, *Anthropometry, *Aircraft seats, Experimental design, Tolerances (Physiology), High acceleration, Acceleration tolerance, Supports, Human body, Cockpits, Geometry, Line of sight, Headrests, Parameters

Identifiers: NTISL0DXA

AD-AC48 458/4ST NTIS Prices: EC A08/MF A01

Estimation of Stature from the Vertebral Column of American Negroes

Air Force Inst of Tech Wright-Patterson AFB Ohio (012200)

Master's thesis

AUTHOR: Tibbets, Gary Lynn

E048114 Fld: 6C, 57A GRAI7806

Sep 77 155p

Rept No: AFIT-CI-78-5

Monitor: 18

Availability: Microfiche copies only.

Abstract: The only other study which addressed the estimation of stature from the vertebral column had been conducted by an American, Thomas Dwight, in 1894, prior to Pearson's comments. Dwight's study utilized intact vertebral columns from cadavers and, although providing an indication of the usefulness of the column for stature estimation, is of little value when dealing with skeletal remains. The purpose of this research is to at least partially fill this void by developing regression formulae for the estimation of stature from the vertebrae of American Negroes. Negroes were chosen for study because of the total lack of previous vertebral studies on this race, and because of the availability of Negro specimens from the Terry Anatomical Collection now located in Washington, D.C.

Descriptors: *Anthropology, *Negroes, *Anthropometry, History, Literature surveys, Statistical analysis, Skeleton, Cadavers, Ethnic groups, Identification, Computer applications, Computer programs, Tables(Data)

Identifiers: Forensic medicine, Forensic science, Vertebrae, *Black Americans, NTISDCDXA

AD-A048 118/4ST NTIS Prices: MF A01

The AMRI Anthropometric Data Bank Library: Volumes I-V

Webb Associates Inc Yellow Springs Ohio (401286)

Technical rept.

AUTHOR: Churchill, Edmund; Churchill, Thomas; Kikta, Paul

E0304A1 Fld: 5E, 5B, 95D, 88B GPAI7804

Oct 77 198p

Contract: F33615-76-C-5007

Project: 7184

Task: 08

Monitor: AMRI-TF-77-1

Prepared in cooperation with Dayton Univ. Research Inst., Ohio.

Abstract: This report describes the contents of Volumes I-V of the AMPL Anthropometric Data Bank Library. Volumes I-IV consist of the data from four major usaf anthropometric surveys: the 1950 and 1967 surveys of flying personnel, the 1968 survey of USAF women, and the 1965 survey of male personnel. Volume V contains correlation coefficients based on these surveys, the 1946 survey of Army female separatees, the Health Examination Survey of 1960-62, and the law enforcement officer survey of 1974. Included are a description of the tape formats, definitions of the measurement variables, and XVAL listings for each tape. Names and serial numbers of all subjects have been omitted to preserve the confidential nature of the records.
(Author)

Descriptors: *Anthropometry, *Data banks, *Air Force personnel, *Flight crews, Males, Females, Surveys, Correlation techniques, Coefficients, Sizes (Dimensions), Human body, Computer programs, Tables (Data)

Identifiers: XVAL computer program, *Libraries, NTISECDXA

AD-A047 314/CST NTIS Prices: PC A09/MF A01

Anthropometric Survey of Truck and Bus Drivers: Anthropometry, Control
Reach and Control Force

Canyon Research Group, Inc., Westlake Village, Calif.*Bureau of Motor
Carrier Safety, Washington, D.C.

Final rept.

AUTHOR: Sanders, Mark S.

E0242J2 Fld: 5E, 13F, 85D, 95D GRAI7803

Feb 77 132p

Contract: DOT-FH-11-8817

Monitor: FHWA-BMCS-77-2-1

Abstract: A mobile lab was constructed to collect data on static and dynamic anthropometry, reach envelope, sleep envelope and force production to steering wheel and brake-clutch pedals on 227 truck and 50 bus drivers. There were essentially no differences between truck and bus drivers on the static measures. The drivers were larger than general civilian or military populations and truck drivers measured 25 years before. For all static and dynamic measures, the mean, standard deviation, standard error, 5th, 50th, 95th percentiles, kurtosis and skewness values are presented. The 5th, 10th and 20th percentile values for front, right side, and behind the seat reach envelopes are presented. Wearing a winter jacket restricted reach by approximately 2 inches. Maximum force (torque on wheel) and sustained force (torque) at max plus 5, 10, 15 seconds are presented. Steering wheel torque is compared to torques provided during front tire blowout conditions. (Portions of this document are not fully legible)

Descriptors: *Anthropometry, *Motor vehicle operators, *Human factors engineering, Trucks, Buses(Vehicles), Steering, Braking, Measurement, Torque, Eye movements, Sleep, Traffic safety, Positioning reactions

Identifiers: Biomechanics, NTISDOTFHA, NTISDOTMCS

FB-273 514/OST NTIS Prices: PC A07/MF A01

Anthropometry of Infants, Children and Youths to Age 18 for Product Safety Design

Michigan Univ., Ann Arbor. Highway Safety Research Inst. *Consumer Product Safety Commission, Bethesda, Md. (407 825)

Final rept. Apr 75-Apr 77

AUTHOR: Snyder, R. G.; Schneider, L. W.; Cwings, C. L.; Reynolds, H. M.; Golcmt, D. H.

D3391E3 Fld: SE, 5A, 95D*, 96D GRAI7722

31 May 77 623p*

Rept No: UM-HSRI-77-17

Contract: CPSC-C-75-0068

Monitor: 18

Abstract: A total of 87 traditional and functional body measurements were taken on a sample of 4127 infants, children and youths representing the U.S. population aged 2 weeks through 18 years. Measurements were taken throughout the United States by two teams of anthropometrists using an automated anthropometric data acquisition system. Standard anthropometers, calipers, and tape devices were modified to read electronically and input dimensional data directly to a mini-computer for data processing and storage. Summary statistics of measurement results are reported for 16 age groups along with scatter plots of the data points for the sexes combined and males and females separately. Each measurement is described along with a photograph and illustration. In addition bivariate relationships of selected functional measurements with weight or stature are provided along with regression data.

Descriptors: *Consumer affairs, *Product safety, *Anthropometry, Children, Infants, Youths, Measurement, United States, Data processing, Statistical analysis, Males, Females, Human factors engineering

Identifiers: NTISESRI, NTISEXCPSC

PB-270 227/2ST NTIS Prices: PC A99/MF A01

A Foundation for Systems Anthropometry. Phase I

Michigan Univ Ann Arbor Highway Safety Research Inst (407825)

Interim scientific rept. 1 Jun-30 Nov 76

AUTHOR: Reynolds, Herbert M.

D3345J3 Fld: SE, 95D GRAI7722

31 Jan 77 132p

Rept No: UM-HSRI-77-7

Contract: F44620-76-C-0115

Project: 2313

Task: A4

Monitor: AFOSP-TR-77-0911

Availability: Microfiche copies only.

Abstract: The purpose of the present program is to conduct basic research into the properties and requirements of three-dimensional dynamic anthropometry. In essence, the research has the expressed goal of inductively describing the linkage of the whole body for predicting body motion in three-dimensional dynamic computer simulations. This effort may be divided into three subsidiary tasks dealing with (1) the identification, location, and relationship of externally and internally 'stable' landmarks; (2) the definition of whole body and segment anatomical axes systems; and (3) the quantitative description of body motion with probabilistic characteristics of each major joint center of mobility. (Author)

Descriptors: *Anthropometry, *Human factors engineering, Biomechanics, Computerized simulation, Human body, Joints(Anatomy), Radiography, Sizes(Dimensions), Muscles, Measurement, Pelvis, Coordinates, Safety, Methodology, Systems approach, Three dimensional

Identifiers: NTISLDDXA

AD-AC42 890/4ST NTIS Prices: MF A01

The Tlaxcaltecs: Prehistory, Demography, Morphology and Genetics

Kansas Univ., Lawrence. Dept. of Anthropology.

AUTHOR: Crawford, Michael H.

D3295J2 Fld: 5K, 92C GRAI7721

1976 217p

Rept No: Eubs in Anthropology-7

Monitor: 18

Abstract: This volume is based upon a 1974 symposium entitled 'Population Studies in Tlaxcala, Mexico'. The volume is divided into three sections. The first introduces the reader to the prehistorical, historical, and demographic characteristics of the several populations under study. The second documents the morphological characteristics and microdifferentiation of the Tlaxcaltecan communities. The final section focuses upon the disease patterns and compares genetic and evolutionary changes in allelic frequencies of these Mexican populations. The varying amounts of admixture between Indian's and Spaniard's is noted.

Descriptors: *Social anthropology, *Mexico, *Meetings, Populations, Genetics, History, Ethnology, Demographic surveys, Archaeology, Culture (Social sciences), Anthropometry, Nutritional deficiency diseases, Mathematical models, Dermatology, Teeth, Hybridization, Foreign countries

Identifiers: Tlaxcala (Mexico), Indians, Spaniards, NTISS LLC

PB-269 238/2ST NTIS Prices: PC A10/MF A01

Acceleration Effects on the Ability to Activate Emergency Devices in
F-4 Aircraft

Naval Air Development Center Warminster Pa Crew Systems Dept (406610
)

Final rept.

AUTHOR: Fessenden, Emma

D3203D1 Pld: 1C, 6S, 51C, 95L, 57W GRAI7721

11 Jul 77 77p

Rept No: NADC-77105-40

Monitor: 18

Abstract: Experiments have been performed and are described in this report which measure the influence of environment on the time it takes to reach an emergency control activation device and which measure the change of physical position at the time of activation due to the environmental forces. Data are reported for both loose and tight torso harness straps. Minus Gx and minus Gz are identified as the components of various likely emergency environments which cause pilots the greatest difficulties. The contribution of combined individual anthropometric measures has been identified as having very pronounced influence on the reachability of certain control devices under specific environments. Improvements in existing seat harness systems and testing for future systems to be developed are recommended. (Author)

Descriptors: *Ejection seats, *Jet fighters, *Acceleration tolerance, Emergencies, Anthropometry, Activation, Control knchs, Harnesses, Test and evaluation, Human factors engineering, Performance (Human)

Identifiers: *F-4 aircraft, NTISDODXA

AD-A042 281/6ST NTIS Prices: FC A05/MF A01

Anthropometric Survey of the Royal Thai Armed Forces

Army Natick Labs Mass (040 300)

AUTHCP: White, Robert M.

D3492K2 Fld: 5F d7723

Jun 64 62

Monitor: 18

Distribution limitation now removed. NOTE: Only 35mm microfilm is available. No microfiche.

Abstract: An anthropometric survey of military personnel of the Armed Forces of Thailand was conducted between October 1962 and March 1963. Body measurements were obtained on a total series of 2,950 men, consisting of 2,010 of the Royal Thai Army, 610 of the Royal Thai Marine Corps, and 330 of the Royal Thai Air Force. Fifty-two measurements were made on each individual. The anthropometric data have been analyzed and are presented. The average height and weight of Thai military personnel were equivalent to the 5th percentile values of height and weight for United States soldiers. The Thai soldier is about four inches shorter in stature and 30 pounds lighter in weight than the average United States soldier. The results of the survey, which provide information on the body size of Thai military personnel, may be utilized in the engineering design and sizing of clothing and equipment intended for use by the Royal Thai Armed Forces. (Author)

Descriptors: (*Anthropometry, Military personnel), (*Military personnel, Thailand), Body weight, Height, Statistical data, Clothing, Design, Human body, Measurement, Human factors engineering, Population, Tables(Data)

Identifiers: NTISL0DXE

AD-450 836/2ST NTIS Prices: PC A04/MF A01

Anthropcmetry of Japanese Pilot

Japanese Air Self-Defense Force Tokyo AERO-Medical Lab (190 625)

Final rept. Mar 61-Mar 62

AUTHCR: Oshima, M.; Fujimoto, T.; Oguro, T.; Tobimatsu, N.; Mcri, T.

D3285B3 Fld: 6N d7721

Mar 65 114p

Project: 7184

Task: 718408

Monitor: AMRL-TR-65-74

Reprint from The Reports of the Aero-Medical Laboratory, 2:2, Mar 62.

Distribution limitation now removed. NOTE: Only 35mm microfilm is available. No microfiche.

Abstract: The results of an anthropometric survey of 239 pilots of the Japanese Air Self-Defense Force are presented. The survey took place in the spring of 1961 at five air bases located throughout Japan. Sixty-two body dimensions were measured on each subject by JASDF flight surgeons. Measurements of the head, face, trunk, arms, and legs were included for the purpose of sizing and designing pressure suits and associated protective gear for use in the F-104J weapon systems program. The percentiles, means, standard deviation, range and coefficient of variation are presented for each body measurement. Comparisons with the 1950 USAF flying population are included. A detailed description is given for each measurement accompanied by explanatory diagrams. A four-size, Height-Weight program for JASDF pilots is presented for use by protective equipment designers. (Author)

Descriptors: (*Pilots, Anthropometry), (*Anthropometry, Pilots), Japan, Body weight, Extremities, Human body, Head(Anatomy), Measurement, United states, Feasibility studies, Pressure suits, Jet fighters, Flight clothing, Protective clothing, Data, Pressure suits

Identifiers: Body height, NTISDODXD

AD-462 062/1ST NTIS Prices: PC A06/MF A01

The "Average Man"

Aerospace Medical Research Labs Wright-Patterson AFB Ohio (009 850)

AUTHOR: DANIELS, GILBERT S.

D302EE4 Fld: 6C d7719

Dec 52 7p

Rept No: tn word 53 7

Monitor: 18

Distribution limitation now removed. NOTE: Only 35mm microfilm is available. No microfiche.

Abstract: No abstract available.

Descriptors: *Anthropometry, *Aviation personnel,

Identifiers: NTISICDXD

AD-010 203/8ST NTIS Prices: PC A02/MF A01

Weight by Height and Age of Adults. United States-1960-1962

National Center for Health Statistics, Rockville, Md. Div. of Health Examination Statistics.**Bureau of the Census, Washington, D.C.

AUTHOR: Roberts, Jean

D2881D2 Fld: 5E, 44C, 95D, 57U, 86I GRAI7717

May 66 46p

Rept No: PHS-Pub-1000-Ser-11-14

Monitor: 18

Pub. as Vital and Health Statistics Ser-11-14. Prepared in cooperation with Bureau of the Census, Washington, D.C. Library of Congress Catalog Card no. 66-60076.

Abstract: The report contains weight by height information for American adults by age and sex, 1960-1962. The report is based on data from the National Health Survey.

Descriptors: *Health statistics, *Body weight, *Anthropometry, United States, Age, Height, Adults, Health surveys, Tables(Data), Statistical data, Measurement, Comparison

Identifiers: Appendices, NTISHRASTI

PB-267 180/8ST NTIS Prices: PC A03/MF A01

Weight, Height, and Selected Body Dimensions of Adults. United States-1960-1962

National Center for Health Statistics, Rockville, Md. Div. of Health Examination Statistics.**Bureau of the Census, Washington, D.C.

AUTHOR: Stoudt, Howard; Damon, Albert; McFarland, Ross; Roberts, Jean
D2881B4 Fld: 5E, 44C, 57A, 95D, 86I GRAI7717

Jun 65 54p

Rept No: DHEW/PUB/HRA-76/1074, PHS-Pub-1000-Ser-11-8

Monitor: 18

Pub. as Vital and Health Statistics Ser-11-8. Prepared in cooperation with Bureau of the Census, Washington, D.C. Library of Congress catalog card no. 65-60069.

Abstract: The report presents findings on weight, height and selected body dimensions of adults, United States 1960-1962. Measurements include age and sex distributions for weight, height, erect sitting height, normal sitting height, knee height, popliteal height, elbow rest height, thigh clearance height, buttock-knee length, buttock-popliteal length, elbow-to-elbow breadth, and seat breadth. The report is based on data from the Health Examination Survey.

Descriptors: *Health statistics, *Anthropometry, Body weight, Height, Adults, United States, Health surveys, Age, Sex, Males, Females, Distribution, Tables(Data), Statistical data, Examinations, Comparison, Ethnic groups, Socioeconomic factors, Military personnel

Identifiers: Race, NTISHRASTI

PB-267 174/1ST NTIS Prices: PC A04/MF A01

Air Force Flight Test Center Technology Needs

Air Force Flight Test Center Edwards AFB Calif (C12100)

Final rept. for period ending CY 1976

AUTHOR: Coleal, Ernest

D2855H1 Fld: 1C, 14B, 51F GRAI7717

May 77 17p

Rept No: AFFTC-TR-77-14

Monitor: 18

Abstract: This document presents all of the 1976 technology needs of the Air Force Flight Test Center. The technology needs are: engineering anthropometric and biomechanical evaluation of aircraft crew station geometries, vector miss distance indicator, automatic scoring system for air-to-air and air-to-ground gunnery, an automatic bomb scoring system, and an airborne instrumentation system for measurement of jet engine nozzle exhaust-gas velocity.

Descriptors: *Air Force research, Flight testing, Test equipment, Technology forecasting, Air Force facilities, Test facilities, Military requirements, Instrumentation, Firing error indicators, Aerial gunnery, Bombing, Scoring, Miss distance, Anthropometry, Flight crews, Cockpits, Biomechanics, Exhaust gases, Jet engines, Air Force planning

Identifiers: *Technology needs, Air Force Flight Test Center, NTISDODXA

AD-A040 580/3ST NTIS Prices: PC A02/MF A01

Relationship between Measures of Body Fat and Gross Motor Proficiency

Naval Medical Research Inst Bethesda Md (249650)

Medical research progress rept.

AUTHOR: Brady, J. I.; Knight, D. R.; Berghage, T. E.

D2855F3 Fld: 5J, 6P, 92B, 57S GRAI7717

21 Oct 75 8p

Project: MPN10

Task: MPN1003

Monitor: 18

Availability: Pub. in Jnl. of Applied Psychology, v62 n2 p224-229
1977.

Abstract: The present study sought to determine the relationship between body fat and various components of gross motor proficiency. Ten tests of gross motor performance, previously shown by Fleishman to be reliable diagnostic indexes of nine separate gross motor factors, were administered to 56 students in the U.S. Naval School of Diving and Salvage. Six anthropometric indicators of body fat were also obtained from each student. Factor analyses confirmed the structure of the measures of physical proficiency and indicated the presence of a single dimension for body fatness. Tests of the relationships between body fatness and the components of physical proficiency revealed a selective effect where body fatness was significantly related to performance on only three of the nine component measures: dynamic strength, gross body coordination, and stamina. Controlling for subject age reduced the magnitude of the correlations by a slight degree, but did not otherwise alter the relationships. (Author)

Descriptors: *Body weight, *Psychomotor function, Anthropometry, Fat cells, Factor analysis, Exercise (Physiology), Reprints

Identifiers: NTISDODXR

AD-A040 574/6ST NTIS Prices: PC A02/MF A01

Middle-Aged Male Competitive Swimmers. Background and Body Structure Characteristics

Naval Health Research Center San Diego Calif (391642)

Final rept.

AUTHOR: Rahe, Richard H.; Carter, J. E. Lindsay

D2853J3 Fld: 6C, 57A GRAI7717

1976 14p

Rept No: 74-69

Monitor: 18

Availability: Pub. in Jnl. of Sports Medicine and Physical Fitness, v16 n4 p309-318 Dec 76.

Abstract: Forty-two male swim competitors, between the ages of 40 and 59 years, took part in a questionnaire and somatotype measurement study during the 1972 U.S. Masters long-course national champions. Nearly 70 percent of all male competitors in this age range participated in the study. The men proved to be extremely homogeneous in terms of race, education, occupation, and past swimming experience. Somatotype data gathered on the men did not differentiate swimmers in their 70's from swimmers in their 50's, nor did somatotype differentiate champions from non-champions. A comparison was made in body structure characteristics for the sub-group of U.S. Masters champions with two previously studied groups of champion swimmers when these other swimmers were in their twenties. (Author)

Descriptors: *Swimmers, *Anthropometry, Males, Physical fitness, Aging(Physiology), Body weight

Identifiers: Competition, Reprints, Questionnaires, Surveys, Somatotyping., NTISDODXR

AD-A040 494/7ST NTIS Prices: PC A02/MF A01

Improved Seat, Console, and Workplace Design: Annotated Bibliography,
Integration of the Literature, Accommodation Model, and Seated
Operator Reach Profiles

Texas Tech Univ Lubbock (405703)

Technical publication

AUTHOR: Ayoub, M. M.; Halcomb, C. G.

D2853F4 Fld: 5E, 95D, 94D GRAI7717

31 Dec 76 347p

Contract: N61756-75-M-2986

Project: F55525

Task: WF55525403

Monitor: PMTC-TP-76-1

Abstract: This report was prepared with the objective of integrating pertinent information regarding seat, console, and workplace design. The four sections include: 1 An annotated bibliography about seating, console, and workplace designs. Each relevant publication is summarized to reflect a category, author, title, methodology, rationale, significant results, conclusions, and recommendations; 2 Integration of the seat, console, and workplace design. The detailed aspects of these components and their relationship to each other in making up the workplace are discussed; 3 A workplace-accommodated percentage evaluation model. A model and preliminary results are presented to show the percentage excluded from a seat/console design, given the percentage excluded based on individual dimensions; and 4 Reach profiles for restrained and unrestrained males and females. Reach envelope data and new methodologies for collecting data are presented, and are compared with existing reach data.

Descriptors: *Human factors engineering, *Consoles, *Workplace layout, *Seats, Anthropometry, Literature surveys, Operators(Personnel), Bibliographies, Assessment, Restraint, Models, Modification, Experimental design

Identifiers: Reach, NTISDODXA

AD-A040 479/8ST NTIS Prices: PC A15/MF A01

Human Variability and Respirator Sizing

Webb Associates, Inc., Yellow Springs, Ohio.*National Inst. for Occupational Safety and Health, Cincinnati, Ohio. Div. of Physical Sciences and Engineering. (401 286)

Technical information rept.

AUTHOR: McConville, John T.; Churchill, Edmund

D2661C1 Fld: 5E, 95D GRAI7715

Mar 76 90p

Contract: PHS-HSM-99-73-15

Monitor: NIOSH-76/146

Abstract: Anthropometry is discussed and data are given to assist in the designing and sizing of respirator facepieces. Racial, ethnic, and sexual differences in the measurements or proportions are discussed. A sizing and design concept and a research procedure are recommended with diagrams and descriptions of head and face measurements.

Descriptors: *Anthropometry, *Protective mask facepieces, Design, Protective masks, Sex, Ethnic groups, Size determination, Head(Anatomy), Face(Anatomy), Humans, Research

Identifiers: Race, NTISHEWOSH

PB-266 412/6ST NTIS Prices: PC A05/MF A01

Development of a One Piece Infantry Helmet

Army Natick Research and Development Command Mass Clothing Equipment
and Materials Engineering Lab (408902)

Technical rept.

AUTHOR: McManus, Lawrence R.; Durand, Philip E.; Claus, William D. Jr
D2424G3 Fld: 6Q, 5E, 95D GRAI7714

Jan 76 48p

Rept No: CEMEL-152

Project: 1T763726D669

Monitor: NARADCOM-TR-76-30-CEMEL

Abstract: The Army Materiel Development and Readiness Command interlaboratory helmet development program is outlined, and the steps taken to develop a new infantry helmet are reported. The results of studies ranging from anthropometry to wearability were synthesized into a military helmet design. Studies included a mathematical sizing model, human factors compatibility evaluations, heat transfer and transient deformation measurements, suspension system designs, and ballistic materials investigations. The resulting three size, one-piece ballistic helmet offers significantly improved protection, fit, comfort, and stability over the standard M-1 helmet and nylon liner. (Author)

Descriptors: *Helmets, *Human factors engineering, Clearances, Sizes(Dimensions), Anthropometry, Fabrication, Experimental design, Life expectancy, Suspending(Hanging), Laminates, Military equipment, Terminal ballistics, Protection, Heat transfer

Identifiers: NTISDODXA

AD-A038 766/2ST NTIS Prices: PC A03/MF A01

Verification Fit Test of Three Size Infantry Helmet

Army Natick Research and Development Command Mass Clothing Equipment
and Materials Engineering Lab (408902)

Technical rept.

AUTHOR: McManus, Lawrence R.; Claus, William D. Jr; Durand, Philip E.;
Kulinski, Michael

D2424G2 Fld: 6Q, 5E, 95D GRAI7714

Jan 75 47p

Rept No: CEMEL-143

Project: 1T763726D669

Task: 01

Monitor: NARADCOM-TR-75-79-CEMEL

Abstract: This report presents the statistical analysis of data generated by a fitting test of a 3 size infantry helmet system. The report includes analyses of anthropometric head data over the total population of 403 test subjects as well as an analysis of the population within each size for the three helmets. In addition, the report presents an analysis of helmet stand-off from the head as compared to a designed minimum stand-off of 12.5mm. (Author)

Descriptors: *Helmets, *Human factors engineering, Clearances,
Anthropometry, Head(Anatomy), Sizes(Dimensions), Statistical analysis,
Population, Military equipment

Identifiers: NTISDODXA

AD-A038 765/4ST NTIS Prices: PC A03/MF A01

User's Guide for the Programs of COMBIMAN (COMputerized BIomechanical MAN-Model)

Dayton Univ Ohio Research Inst (105400)

Technical interim rept.

AUTHOR: Evans, Susan M.

D2283H3 Fld: 5H, 9B, 95D, 62B GRAI7713

Nov 76 169p.

Rept No: UDRI-TR-76-71

Contract: F33615-75-C-5092

Project: 7184

Task: 08

Monitor: AMRL-TR-76-117

Abstract: This User's Guide has been developed to describe the operational procedures to be followed when using the AMRL COMBIMAN (COMputerized BIomechanical MAN-model) programs. The Guide is based on the programs as they stand as of 1 November 1976. The Guide includes an introduction to the COMBIMAN man-model and the conventions used to develop and analyze workstations. It also deals with the operation of three of the programs which make up the COMBIMAN system. These programs include the heart of the COMBIMAN system, the interactive graphics program CBM04, and the two key file creation/modification programs CBMAM, which maintains the data base of anthropometric surveys, and CMBWM, which maintains the data base of workstation configurations. The guide to the operation of the three main routines includes descriptions of the processing available with each program, definitions and examples of all input and output data formats used, procedures to follow to load the programs and specify processing for each, and explanations of all diagnostic messages generated by the programs. (Author)

Descriptors: *Workplace layout, *Computerized simulation, *Pilots, Anthropometry, Anatomical models, Subroutines, Computer programs, Interactions, Interactive graphics, Computer graphics, Three dimensional, Cathode ray tubes, Data bases, Guides

Identifiers: *Combiman computer program, Human factors engineering, NTISDODXA

AD-A038 323/2ST NTIS Prices: PC A08/MF A01

Development and Evaluation of Masterbody Forms for 3- and 6-Year-Old-Child Dummies

Federal Aviation Administration Washington D C Office of Aviation Medicine (264320)

AUTHOR: Young, Joseph W.; Reynolds, Herbert M.; McConville, John T.; Snyder, Richard G.; Chandler, Richard F.

D2132F2 Fld: 5E, 95D GRAI7712

Jul 76 43p

Rept No: FAA-AM-76-9

Monitor: 18

Abstract: This study defines and evaluates the size, shape, and mass distribution characteristics of masterbody forms representative of 3-year-old and 6-year-old U.S. children. Based on the author's collective judgment of available data, 98 anthropometric dimensions were selected and used to develop full-scale clay masterbody forms for reproduction in casting stone. The stone models were segmented into 10 primary body components representing the head, neck, upper torso, lower torso, upper arm, lower arm, hand, upper leg, lower leg, and foot. Weight, volume, center of mass, and mass moments of inertia measured on each body segment are presented in this report. (Author)

Descriptors: *Anthropometry, Children, Sizes(Dimensions), Mathematical models, Molds(Forms), Mass, Clay

Identifiers: *Dummies(Human), United States, Human factors engineering, Anatomical models, NTISDODXA

AD-A037 547/7ST NTIS Prices: PC A03/MF A01

Programmable Anthropomorphic Articulation

Department of Transportation, Washington, D.C. (403 753)

Patent

AUTHOR: Haffner, Mark P.; Pizer, Robert S.

D2082G4 Fld: 6B, 90D, 95C GRAI7711

Filed 7 Jan 76, patented 4 Jan 77 8p

Rept No: PAT-APPL-647 317, PATENT-4 000 564

Monitor: 18

Supersedes PB-248 689.

This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 \$0.50.

Abstract: The patent discloses an anthropomorphic programmable joint which joins two limb portions. The joint may simulate the knee joint and the portions may correspond to the upper and lower leg portions about the knee. A magnetic particle brake is attached to the upper portion with a shaft that carries the pinion gear of a bevel gear set located at the joint. The ring gear of the bevel gear set is fixed to the lower limb portion so that rotation of the lower limb portion about the joint causes the shaft to rotate the magnetic brake fixed to the upper portion. The brake resistance to this rotation, and therefore the resistance of the joint to rotation, may be programmed in correspondence to electrical current applied to the brake.

Descriptors: *Patents, *Anatomical models, *Joints (Anatomy), Simulation, Knee (Anatomy), Man machine systems, Anthropometry

Identifiers: PAT-CL-35-17, NTISGPDOT

PB-263 724/7ST NTIS Prices: Not available NTIS

Index to FAA Office of Aviation Medicine Reports: 1961 through 1976

Federal Aviation Administration Oklahoma City Okla Civil Aeromedical
Inst (084050)

AUTHOR: Murcko, LaNelle E.; Dille, J. Robert

D2005B1 Fld: 6E, 5B, 57E, 88E GRAI7711

Jan 77 65p

Monitor: FAA-AM-77-1

Abstract: An index to Office of Aviation Medicine Reports (1964-1976) and Civil Aeromedical Research Institute Reports (1961-1963) is presented as a reference for those engaged in aviation medicine and related activities. It provides a listing of all FAA aviation medicine reports published from 1961 through 1976 by year, number, author, title, and subject.

Descriptors: *Aviation medicine, *Indexes, Stress(Physiology), Aerial delivery, Air traffic controllers, Aviation accidents, Performance(Human), Safety, Anthropometry, Visual perception

Identifiers: Federal Aviation Administration, NTISDODXA

AD-A037 234/2ST NTIS Prices: PC A04/MF A01

Biomechanics and Anthropometry for Cockpit and Equipment Design

Dayton Univ Ohio Research Inst (105400)

Final rept. 1 dec 75-31 Dec 76

AUTHOR: Evans, Susan M.; Himes, Martin J.; Kikta, Paul E.

D1995H3 Fld: 5E, 95D GRAI7711

Mar 76 91p

Rept No: UDRI-TR-76-85

Contract: F33615-75-C-5092

Project: 7184

Task: 08

Monitor: AMRL-TR-77-7

Abstract: This report describes enhancements made to the AMRL COMBIMAN (COMputerized BIOMEchanical MAN-model) program in the areas of man-model link-system and enfleshment characteristics, and in the area of additional functions or options made available to the user of the interactive graphics computer program of COMBIMAN. These new functions include obtaining hard-copy plots of the man-model and workstation as displayed on the Cathode Ray Tube (CRT), and obtaining visibility plots of the workstation boundary. The report also documents technical procedures followed in readying the AMRL HERCULES (Human Engineering Research to Cull Efficient Strength) Lab for measuring strength capabilities of seated operators, and the procedures established for running the subjects and gathering the data. The last area covered in this report is the development of programs and the manipulation of anthropometric data used in the analysis of human size variability data.

Descriptors: *Anthropometry, *Biomechanics, Computer applications, Workplace layout, Computer programs, Models, Cockpits, Protective equipment, Analogs, Strength(Physiology), Human factors engineering

Identifiers: NTISDODXA

AD-A037 020/5ST NTIS Prices: PC A05/MF A01

Actuator Device for Artificial Leg

National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

Patent.

AUTHOR: Burch, J. L.

D1965B3 Fld: 6B, 95C, 95A, 44H, 90D STAR1505

Patented 7 Dec 76 7p

Rept No: PATENT-3 995 324, PAT-APPL-612 965

Monitor: 18

Misc-Filed 12 Sep. 1975 Supersedes N75-32767 (13 - 23, p 2963).

This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of Patent available Commissioner of Patents, Washington, D.C.

Abstract: An actuator device is described for moving an artificial leg of a person having a prosthesis replacing an entire leg and hip joint. The device includes a first articulated hip joint assembly carried by the natural leg and a second articulated hip joint assembly carried by the prosthesis whereby energy from the movement of the natural leg is transferred by a compressible fluid from the first hip joint assembly to the second hip joint assembly for moving the artificial leg.

Descriptors: *Actuators, *Bioengineering, *Hydraulic equipment, *Leg (Anatomy), *Prosthetic devices, *Patents, Anthropometry, Human factors engineering, Joints (Anatomy)

Identifiers: PAT-CL-3-1.2, NTISNASA

N77-14735/3ST NTIS Price: Not available NTIS

Effects of Encumbering Clothing, Personal-Protective Equipment and
Restraints on Body Size and Arm-Reach Capability of USAF Aircrewmembers

Webb Associates Inc Yellow Springs Ohio (401286)

AUTHOR: Alexander, Milton; Laubach, Lloyd L.; McConville, John T.

D1862K3 Fld: 5E, 95D GRAI7710

May 76 4p

Contract: F33615-76-C-5007

Project: 7184

Task: 12

Monitor: AMRL-TR-76-118

Presented at the Aerospace Medical Association meeting, Bal Harbour,
Fla., 10-13 May 76.

Abstract: Basic anthropometric dimensions provide engineers and designers with data on the range of body size variability that must be accommodated in the design and development of clothing, personal-protective equipment and workspaces. Designers of cockpits and similar workspaces must also be cognizant of the growth in body size associated with various configurations of clothing and personal-protective equipment and the effects of these assemblies on performance of the users. A study of a stratified sample of 32 USAF pilots wearing their operational assemblages of over-land and over-water flight gear and equipment was conducted. The study determined changes in critical workspace dimensions and arm and leg reach performance due to encumbrances of the clothing and equipment. The results of the investigation indicated changes occurred both in body size and performance which are of significance to designers. (Author)

Descriptors: *Anthropometry, *Human factors engineering,
Growth(Physiology), Workplace layout, Cockpits, Protective clothing,
Protective equipment, Performance(Human), Pressure suits

Identifiers: Comfort, NTISDODXA

AD-A036 682/3ST NTIS Prices: PC A02/MF A01

Exoskeleton Prototype Project

General Electric CO Schenectady N Y Research and Development Center
(149 440)

Appendix to final rept. on phase 1.

D1742I3 Fld: 5H d7709

28 Oct 66 81p

Rept No: S-67-1016

Contract: N00014-66-C-0051

Project: NR-169-049, DA-IM624101050702

Monitor: 18

Includes Appendices 1 thru 9. Appendix to Rept. no. S-67 1011, dated
28 Oct 66, AD-807 467.

Distribution limitation now removed.

Abstract: Contents: Technical Requirements; Leg Velocity Studies;
Safety Check List; Nyplot Program; MLINKS Program; Effect of
Compliance on Clearance; Slave Actuator Design Procedure; Hydraulic
Signalling Accuracy and Endurance Test; Hydraulic Position Signalling;
and Concept Layout of Exoskeleton.

Descriptors: (*Man machine systems, *Hydraulic servomechanisms),
Computer programs, Cybernetics, Anthropometry, Actuators, Hydraulic
actuators, Design, Strain(Mechanics), Vibration, Safety,
Specifications, Human factors engineering, Extremities, Motion

Identifiers: NTISDODXD

AD-820 306/9ST NTIS Prices: PC A05/MF A01

Anthropometric Survey of the Imperial Iranian Armed Forces. Volume I.
Data Collection and Analysis

Imperial Iranian Ground Forces Combat Research and Evaluation Center
(410042)

Technical rept.

AUTHOR: Noorani, Shoja-eddin; Dillard, Clarence N. Jr

D1705G3 Fld: 5E GRAI7709

Nov 70 103p

Monitor: 18

Text in English and Persian. See also Volume 2, AD-A035 650.

Abstract: An anthropometric survey of the Imperial Iranian Armed Forces was undertaken by the Combat Research and Evaluation Center (CREC). The main objective of the survey was to provide the Imperial Iranian Armed Forces a basis for determining how to improve their uniforms and tariffs. At the same time, it would demonstrate the value of CREC as the Iranian center for military-oriented research.

Descriptors: *Anthropometry, *Iran, Military forces(Foreign), Data acquisition, Distribution, Planning, Military uniforms, Standards, Statistical analysis

Identifiers: Military personnel, Human factors engineering, NTISDODXA

AD-A035 649/3ST NTIS Prices: PC A06/MF A01

Anthropometric Survey of the Imperial Iranian Armed Forces. Volume II.
Statistical Data

Imperial Iranian Ground Forces Combat Research and Evaluation Center
(410042)

Technical rept.

AUTHOR: Noorani, Shoja-eddin; Dillard, Clarence N. Jr

D1705G4 Fld: 5E GRAI7709

Mar 71 504p

Monitor: 18

See also Volume 1, AD-A035 649.

Abstract: An Anthropometric Survey of the Imperial Iranian Armed Forces was undertaken by the Combat Research and Evaluation Center as directed by the Vice Chief of Supreme Commander's Staff. The objective of the anthropometric survey was to provide statistical data as a basis for decisions relating to planned revision of the Imperial Iranian Armed Forces uniforms and tariffs.

Descriptors: *Anthropometry, *Iran, Military forces(Foreign), Planning, Military uniforms, Statistical data, Standards, Statistical analysis

Identifiers: Human factors engineering, NTISDODXA

AD-A035 650/1ST NTIS Prices: PC A22/MF A01

Osteoarthritis and Body Measurements

National Center for Health Statistics, Rockville, Md.

Rept. for 1960-62

AUTHOR: Engel, Arnold

D1654J4 Fld: 6E d7708

Apr 68 45p

Rept No: PHS-Pub-1000-Ser-11-29

Monitor: 18

Pub. as Vital and Health Statistics Ser-11-29. Library of Congress catalog card no. 67-61856.

Abstract: Between 1959 and 1962 the Health Examination Survey conducted a series of examinations on a probability sample of the civilian, noninstitutionalized population of the continental United States between 18 and 79 years of age. A detailed description of the sample and response of the 6,672 persons who were examined has been published. The survey was designed to obtain information on certain chronic diseases, on dental health, and on the distribution of some anthropometric and sensory characteristics. The sample persons were given a standard examination, which lasted about 2 hours, in mobile clinics especially designed for the purpose. The relation between physique and susceptibility to osteoarthritis has been a matter of interest for many years. Clinicians have felt that obesity must be considered as a factor in the genesis of osteoarthritis, due to increased mechanical strain on weight-bearing joints.

Descriptors: *Osteoarthritis, *Anthropometry, *Health surveys, Arthritis, Musculoskeletal disorders, Diagnosis, Sex, Age, Tables(Data), Medical examinations, Body weight

Identifiers: NTISHRASTI

PB-262 957/4ST NTIS Prices: PC A03/MF A01

Portable Seating Apparatus

Department of the Navy Washington D C (110050)

Patent Application

AUTHOR: Peters, Peter A. C.

D1411G2 Fld: 5E, 95D, 90D GRAI7707

Filed 4 Oct 76 11p

Rept No: PAT-APPL-729 049

Monitor: 18

This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Abstract: The patent application discloses a portable seating bench for positioning subjects for anthropometric measurements. An object of the invention is to provide a new and improved portable seating bench provided with an adjustable foot support. Another object of the invention is to provide a new and improved seating bench which may be employed to standardize anthropometric measurements of seated subjects at different locations.

Descriptors: *Patent applications, *Seats, *Anthropometry, Portable equipment, Feet, Measurement

Identifiers: NTISGPN

AD-D003 273/OST NTIS Prices: PC A02/MF A01

A Physical Model for Estimating Body Fat

School of Aerospace Medicine Brooks AFB Tex (317C00)

Interim rept. May 72-May 76

AUTHOR: Clark, Dale A.

D1302G2 Fld: 6P, 57A, 57S GRAI7706

Nov 76 13p

Rept No: SAM-TR-76-41

Project: AF-7755

Task: 775518

Monitor: 18

Abstract: The report describes a set of measurements of lengths, circumferences, and skinfold thickness by which to estimate the volume of fat in human subjects. The fat mass of seven body compartments is estimated and summed to obtain an estimate of the total body fat. Measurements were made on 61 young men. Body compositions computed from these measurements were compared with estimates made at about the same times using a body volumeter. Correlation coefficients for lean mass, fat mass, and percent body fat were 0.926, 0.845, and 0.756, respectively. Changes in fat mass estimated by the two methods were compared with the corresponding changes in body weight. Results from the anthropometric model were apparently as dependable as those obtained with the body volumeter. The anthropometric model is therefore considered acceptable for monitoring body composition when the composition can be checked occasionally with a body volumeter. Such a check is required to calibrate the anthropometric model, which tends to overestimate fat in lean men and underestimate it in fat men.

Descriptors: *Anatomical models, *Anthropometry, Mass, Body weight, Calibration, Humans, Males

Identifiers: *Body fat, Body composition, NTISDODAF

AD-A034 111/5ST NTIS Prices: PC A02/MP A01

Personnel Guardrails for the Prevention of Occupational Accidents

National Bureau of Standards, Washington, D.C. Center for Building Technology.*Occupational Safety and Health Administration, Washington, D.C.

Final rept.

AUTHOR: Fattal, S. G.; Cattaneo, L. E.; Turner, G. E.; Robinson, S. N.
D1241B3 Fld: 6Q, 13L, 94H, 95D, 86V GRAI7705

Nov 76 81p

Rept No: NBSIR-76-1132

Monitor: 18

Sponsored in part by Occupational Safety and Health Administration, Washington, D.C.

Abstract: Existing information is compiled which would assist in determining structural and non-structural safety requirements for guardrails used for the protection of employees against occupational hazards. Critical aspects of guardrail safety are identified through exploratory studies consisting of field surveys of prototypical installations, reviews of existing standards and industrial accident records, and compilation of relevant anthropometric data. These exploratory studies will be utilized to design an experimental program which will consist of structural tests to determine design loads and non-structural tests to determine geometric requirements for guardrail safety.

Descriptors: *Accident prevention, Industrial accidents, Loads (Forces), Personnel, Anthropometry, Standards, Reviews, Performance standards, Design, Tables(Data)

Identifiers: *Occupational safety and health, *Guardrails, NTISCOMNBS, NTISHEWOSH

PB-260 363/7ST NTIS Prices: PC A05/MF A01

Computerized Biomechanical Man-Model

Aerospace Medical Research Lab Wright-Patterson AFB Ohio (009850)

AUTHOR: McDaniel, Joe W.

D1095I4 Fld: 5E, 94D*, 70D* GRAI7705

Jul 76 27p

Rept No: AMRL-TR-76-30

Project: AF-7184

Task: 718408

Monitor: 18

Presented at the International Ergonomics Association Meeting, College Park, Md., 15 July 1976.

Abstract: The COMPUTERIZED BIOMECHANICAL MAN-model (called COMBIMAN) is a computer interactive graphics technique for workplace design. This model allows a designer, sitting at a CRT, to manipulate a three-dimensional male form of variable anthropometry and to design a workplace around him by means of a lightpen. While originally intended for aircraft design and evaluation, the general format of the model is suitable for consideration of virtually any workplace configuration and can be used to evaluate existing or theoretical workplaces with equal ease and precision.

Descriptors: *Workplace layout, *Computer graphics, Computer aided design, Anthropometry, Human factors engineering, Computerized simulation, Anatomical models

Identifiers: NTISDODAF

AD-A032 402/OST NTIS Prices: PC A03/MF A01

Adjustable Anthropometer

Department of the Navy

Patent

AUTHOR: Gregoire, Harvey G.

D0905B4 Fld: 90 d7701

Filed 1 Feb 70, patented 27 Mar 73

Rept No: PAT-APPL-111 384

Monitor: 18

This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 \$0.50.

Abstract: An anthropometric device designed to provide accurate measurements for evaluation of crew station design. The device can be adjusted to simulate various anthropometric dimensions. Modified retractable tape measures provide arm reach and leg reach distances. A head assembly includes a 180 degree compass and a retractable reference line to provide angle of vision measurements in elevation and azimuth. The device also includes hip, back and shoulder assemblies which can be adjusted to any percentile rank dimension specified or any population.

Descriptors: *Patents, *Adjustable, *Anthropometer,

Identifiers: PAT-CL-33-174, NTISGPN

PATENT-3 722 103 NTIS Prices: Not available NTIS

Anthropometric Test Dummy, Model 825-50 Operation and Service Manual

Sierra Engineering Co., Sierra Madre, Calif.*National Highway Traffic
Safety Administration, Washington, D.C. (323 150)

Final rept. 1 Dec 72-28 Feb 75

AUTHOR: Roshala, J. L.; Popp, Leonard E.

D0214A1 Fld: 13F, 13L, 14B, 95D, 85D, 85H GRAI7701

Aug 76 100p

Rept No: TR-825-900-2

Contract: DOT-HS-254-3-568

Monitor: DOT-HS-801-972-2

See also PB-257 179.

Abstract: The report covers the development, manufacture, testing, and evaluation of two (2) 50th percentile male anthropomorphic test dummies. The objective was to develop a test dummy which NHTSA could use for compliance tests with appropriate Federal Motor Vehicle Safety Standards in the evaluation of protection systems for vehicle occupants during real and simulated impact conditions. A further objective was to generate a corresponding test dummy data package which could be made available to any source interested in manufacturing, checking, comparing with other dummy configurations and otherwise verifying the accuracy and precision of the various details.

Descriptors: *Collision research, *Anatomical models, *Motor vehicle accidents, Design, Manufacturing, Measurement, Anthropometry

Identifiers: NTISDOTHTS

PB-258 384/7ST NTIS Prices: PC A05/MF AC1

Annotated Bibliography of USAARL Reports

Army Aeromedical Research Lab Fort Rucker Ala (404578)

Rept. for 1 Jun 63-31 Jul 76

AUTHOR: Bullock, Sybil H.

C7613K1 Fld: 6E, 57, 95C GRAI7625

Jan 76 116p

Rept No: USAARL-Special Bib-Ser-7-s1

Monitor: 18

Includes revision dated Sep 76. See also Rept. no. USAARL-Special Bib-Ser-7, AD-A021 204.

Abstract: Technical reports published at the U.S. Army Aeromedical Research Laboratory, Ft. Rucker, Alabama from 1 June 1963 to 31 July 1976 are included in this annotated bibliography. Subject areas covered include Aviation medicine, Bio-engineering, Bio-Optics, Acoustics, and Aviation Psychology. Arrangement is in numerical sequence by Technical Report Number with Subject, Author, and a Cross Index of Joint Reports. (Author)

Descriptors: *Aviation medicine, *Bibliographies, Medical research, Abstracts, Indexes, Bioengineering, Hearing, Optics, Psychology, Noise(Sound), Aeromedical evacuation, Vision, Anthropometry, Drugs, Toxicology

Identifiers: Lighting, NTISDODXA

AD-A030 417/OST NTIS Prices: PCS\$5.50/MF\$3.00

An Annotated Bibliography of United States Air Force Applied Physical Anthropology January 1946 to July 1976

Aerospace Medical Research Lab Wright-Patterson AFB Ohio (009850)

AUTHOR: Reid, Betty

C7513H3 Fld: 5E, 95D GRAI7624

Jul 76 78p

Rept No: AMRL-TR-76-58

Project: AF-7184

Task: 718408

Monitor: 18

Supersedes Rept. no. AMRL-TR-73-51, AD-762 287.

Abstract: This report contains the titles, authors, publication/source information, and the abstracts of 153 technical reports and articles published by Crew Station Integration Branch, Anthropology Section of the Aerospace Medical Research Laboratory between January 1946 and July 1976. It is a detailed document of the scope of the effort of the Air Force in the field of applied physical anthropology to provide the information on human body size and biomechanical characteristics of Air Force personnel required for the development and evaluation of Air Force systems, personal-protective equipment and clothing.

Descriptors: *Anthropometry, *Human factors engineering,
*Bibliographies, Anthropology, Air Force personnel, Military personnel
, Logistics, Abstracts, Biomechanics, Workplace layout

Identifiers: *Physical anthropology, NTISDODXA

AD-A029 942/OST NTIS Prices: PC\$5.00/MF\$3.00

Mass Distribution of the Human Body Using Biostereometrics

Texas Inst for Rehabilitation and Research Houston Tex
Biostereometrics Lab (409828)

Final rept., u7622

AUTHOR: Herron, R. L.; Cuzzi, J. R.; Hugg, J.

C7453K4 Fld: 5E, 95D, 57A GRAI7623

Jun 76 202p

Contract: F33615-74-C-5121

Project: AF-7184

Task: 718408

Monitor: AMRL-TR-75-18

Abstract: Biostereometrics is the spatial and spatio-temporal analysis of biological form and function based on principles of analytic geometry. When applied to humans, it constitutes a modern approach to anthropometry. A suitable stereometric sensor is used to locate the three dimensional coordinates of points distributed over the body surface. The coordinates serve as input to a digital computer which is programmed to yield permutations of numerical or analog (graphical or physical) outputs as the application requires. In the present study, stereophotogrammetry was used to obtain stereometric data in the form of Cartesian coordinates of six segmented human cadavers. Density data provided by the contractor (AMRL) were then used in conjunction with the stereometric data to generate mass, volume, center of mass and principal moments of inertia about the principal axes of inertia with the aid of an IBM 360-50 digital computer. This study was undertaken to further explore the viability of computing mass distribution from biostereometric data and the best available human density values.

Descriptors: *Anthropometry, *Human body, Measurement, Biomechanics, Analogs, Mass, Spatial distribution, Data processing, Photographic analysis, Coordinates, Analytic geometry, Center of gravity

Identifiers: *Biostereometrics, NTISDODXA

AD-A029 402/5ST NTIS Prices: PC\$7.75/MF\$3.00

Functional Two-Dimensional Manikins

Royal Aircraft Establishment, Farnborough (England).

AUTHOR: Jeurgens, H. W.; Helbig, K.; Kopka, T.

C7424L2 Fld: 5E, 95D STAR1417

Mar 76 13p

Rept No: RAE-LIB-TRANS-1859, BR52161

Monitor: 18

Tran-Transl. Into English from Ergonomics (London), V. 18, No. 2, 1975
p 185-194 (Original in German).

Abstract: Two-dimensional manikins are used as tools in designing and assessing workplaces (on a 1:1 scale) in the broadest sense. Models available to date reduce the joints of the human body to fixed axial joints and are therefore incapable of reproducing changes in the shape of the body resulting from movement. A new type of joint in the 'Kieler Puppe' model introduced here for a seated and standing person in profile, and a seated person as seen from above, permits only physiological body postures and reproduces natural body contours in every posture and every postural change. (Author)

Descriptors: *Anthropometry, *Dummies, *Human factors engineering, *Joints (Anatomy), Motion, Physiology, Posture, Two dimensional bodies

Identifiers: Translations, Great Britain, NTISNASAT

N76-26870/5ST NTIS Prices: PC\$3.50/MF\$3.00

Foamed-in-Place Helmet

Tactical Air Warfare Center Eglin AFB Fla (340 610)

Final rept. 15 Sep 70-28 Apr 72

AUTHOR: Balentine, Doyle E.

C7324D1 Fld: 6Q, 5E, 11I d7622

Jul 72 63p

Monitor: TAC-Test-70A-057F

Distribution limitation now removed.

Abstract: The HGU 2A/P helmet was unsatisfactory because of discomfort, lack of retention during ejections, and restricted upward visibility. The Foamed-in-Place helmet process evaluated in this OT&E was an attempt to correct the deficiencies that existed in the former helmet. Life support technicians are capable, with practice, of local fabrication of acceptable Foamed-In-Place helmets. Most of the material and equipment provided were satisfactory; however, some were unacceptable and considerable supplies were required that were not provided. Instructions for the helmet liner forming process, issued by Aeronautical Systems Division, were found to be adequate. The instructions should be refined and photographs and illustrations should be added. Instructions for the helmet fabrication were inadequate. Participating aircrews rated the test helmet superior to the previously used helmets in the areas of comfort (82 percent) and stability (80 percent). No significant difference was noted in restrictions to visibility. Noise attenuation was rated acceptable. (Author, modified-PL)

Descriptors: (*Helmets, *Expanded plastics), Moldings, Isocyanate plastics, Visibility, Ejection, Retention(Psychology), Noise, Ear protectors, Instruction manuals, Manufacturing, Aging(Materials), Catalysts, Humidity, Temperature, Assembly, Drying, Flight crews, Molding materials, Leather, Adhesives, Human factors engineering, Model tests, Pilots, Tactical air command, Acceptability, Technicians, Questionnaires, Anthropometry

Identifiers: Flight clothing, Helmets, Foamed in place helmets, *Helmet liners, Hgu-2a/p helmets, Sizes(Dimensions), NTISDODXD

AD-902 273/2ST NTIS Prices: PC\$4.50/MF\$3.00

Effects of Stressful Underwater Demolition Training on Body Structure

Naval Health Research Center San Diego Calif (391642)

Final rept.

AUTHOR: Carter, J. E. Lindsay; Rahe, Richard H.

C7172D3 Pld: 6S, 57W GRAI7621

Feb 75 8p

Rept No: 74-68

Project: MF51-524

Task: MF51-524-002

Monitor: 18

Availability: Pub. in Medicine and Science in Sports, v7 n4 p304-308
1975.

Abstract: Anthropometric measurements and Heath-Carter somatotype ratings were made on 32 subjects on entry into the U.S.N. underwater demolition training program. Twenty subjects completed the 4-month training and were remeasured and rated. Comparisons were made between initial and final scores for those completing training, and between initial scores for these trainees and the 'dropout' group. Comparisons were made on the following variables: somatotype as a whole, three somatotype components, height, weight, height/weight sum of skinfolds, arm and calf girths, and bone breadths. The training group did not change on height or bone breadths, but decreased on skinfolds and height/weight, and increased on weight and girths. Their somatotype distribution changed, as reflected by decreased endomorphy and ectomorphy, and increased mesomorphy. There were no differences between the initial means of 'dropouts' and the trainees on any variable.

Descriptors: *Underwater demolition teams, *Anthropometry, *Naval training, Height, Weight, Bones, Physical fitness, Predictions, Reprints

Identifiers: Somatotypes, *Stress(Physiology), NTISDODXR

AD-A028 128/7ST NTIS Prices: PC\$3.50/MF\$3.00

International Anthropometric Variability and Its Effects on Aircraft
Cockpit Design

Aerospace Medical Research Lab Wright-Patterson AFB Ohio (009850)

AUTHOR: Kennedy, Kenneth W.

C7155G4 Flt: 1C, 15E, 5E, 51C, 95D GPAI7621

Jul 76 21p

Rept No: AMRL-TR-72-45

Project: AF-7184

Task: 718408

Monitor: 18

Abstract: This paper is concerned with high performance, single seat, military aircraft cockpits and the problems encountered in accommodating them to the anthropometric requirements of foreign military users. These problems often are very difficult. Design changes invariably required to cope with any significant anthropometric differences are fraught with seemingly insurmountable economic and engineering problems. Still, malaccommodation in aircraft not only produces a condition in which the product is inconvenient to operate, but one in which the user's safety and the basic mission of the aircraft can be compromised.

Descriptors: *Cockpits, *Anthropometry, *Human factors engineering, Control sticks, Ethnic groups, Variations, Experimental design, Military forces(Foreign), Posture(Physiology), Height, Sizes(Dimensions), Protective equipment, Control knobs

Identifiers: Reach, Foreigners, NTISDODXA

AD-A027 801/DST NTIS Prices: PC\$3.50/MF\$3.00

Anthropometric Sizing Program for Oral-Nasal Oxygen Masks Based on
1967 U.S. Air Force Survey Data

Webb Associates Inc Yellow Springs Ohio (401286)

AUTHOR: McConville, John T.; Alexander, Milton

C7094H2 Fld: 5E, 6K, 95D, 95E GRAI7620

1975 9p

Contract: F33615-75-C-5003

Project: AF-7184

Task: 718412

Monitor: AMRL-TR-75-51

Availability: Pub. in Aviation, Space, and Environmental Medicine, v46
n11 p1383-1389 Nov 75.

Abstract: A new sizing program for oral-nasal masks, based on total facial length, has been developed through an analysis of the 1967 USAF anthropometric survey head and face data. A four-size series of three-dimensional face forms has been sculpted based on this sizing program as a design aid for sizing such masks. This report includes a discussion of the theoretical and practical aspects of the sizing analyses and procedures, and establishes design limits and procurement tariffs for the four sizes of masks. The MBU-12/P oxygen mask, an oral-nasal, pressure-demand type of mask, has been fabricated in accordance with this sizing system using the face forms as sizing guides. The results obtained during fit-tests using 66 USAF personnel as subjects are described. The authors concluded that the dimensional sizing of the oral-nasal oxygen mask facepieces is valid for USAF flight crews. (Author)

Descriptors: *Anthropometry, *Oxygen masks, Flight crews, Faceplates, Models, Human factors engineering, Experimental design, Fittings, Sizes(Dimensions), Reprints

Identifiers: NTISDODXR

AD-A027 516/4ST NTIS Prices: PC\$3.50/MF\$3.00

Anthropometric Data Presented in Three-Dimensional Forms

Aerospace Medical Research Lab Wright-Patterson AFB Ohio (009850)

AUTHOR: Alexander, Milton; Zeigen, Robert S.; Emanuel, Irvin

C7091A4 Fld: 6N GRAI7620

1961 13p

Project: AF-7184

Task: 718408

Monitor: ASD-TR-61-599

Availability: Pub. in The American Jnl. of Physical Anthropology, V19
n2 p147-157 Jun 61.

Abstract: The Anthropology Section, Aeronautical Systems Division, has used as well as standard approaches in the attempt to translate anthropometric data into three-dimensional forms. Basic anthropometric data must be interpreted for the designer and engineer prior to their application to practical problems. Considerable confusion exists among designers and engineers when it comes to handling anthropometric data for items of close-fitting protective equipment, e.g., pressure suits, oxygen masks and helmets. In the past, various head and body forms have been fabricated to provide the designers with more concrete expressions of anthropometric data. Recent efforts along these lines have led to the development of new three-dimensional forms, some of general application and others for specific problems. The design rationale on which these forms are based and the difficulties encountered in sculpturing them to dimension are discussed.

Descriptors: *Anthropometry, Protective clothing, Headgear, Helmets, Three dimensional, G Suits, Oxygen masks, Human factors engineering, Sizes(Dimensions), Experimental design, Fittings, Models, Reprints

Identifiers: NTISDODXR

AD-A027 345/8ST NTIS Prices: PC\$3.50/MP\$3.00

Air Force Flight Test Center Technology Needs. Annual Report for
Calendar Year 1975

Air Force Flight Test Center Edwards AFB Calif (012100)

Final rept.

AUTHOR: Coleal, Ernest

C6985B4 Fld: 14B, 73D GRAI7619

May 76 18p

Rept No: AFFTC-TR-76-18

Project: AF-9990

Task: 999000

Monitor: 18

Abstract: This document presents all of the 1975 technology needs of the Air Force Flight Test Center in accordance with AFSCR 80-29, Technology Need Program. The technology needs are: engineering anthropometric and biomedical evaluation of aircraft crew station geometries, vector miss distance indicator, automatic scoring system for air-to-air and air-to-ground gunnery, an automatic bomb scoring system, improved water spray/icing system, and an airborne instrumentation system for measurement of jet engine nozzle exhaust-gas velocity. (Author)

Descriptors: *Air Force facilities, *Test facilities, *Technology, Biomedicine, Air Force research, Military requirements, Anthropometry, Flight crews, Miss distance, Measuring instruments, Aerial gunnery, Scoring, Bombing, Automatic, Water Jets, Ice, Jet engines, Nozzle gas flow, Velocity

Identifiers: NTISDODXA

AD-A026 506/6ST NTIS Prices: PC\$3.50/MF\$2.25

Development of a New Infantry Helmet

Army Natick Research and Development Command Mass (392674)
AUTHOR: McManus, Lawrence R., Durand, Philip E., Claus, William D. Jr,
Greendale, John H.
C6863G3 FLD: 6Q, 74E, 95D GRAI7617
1976 15p
MONITOR: 18

ABSTRACT: This paper presents a description of the developmental phases of the new infantry helmet; the pertinent results of studies are cited but the detailed data are included in the program reports listed in the bibliography.

DESCRIPTORS: *Helmets, Edges, Human factors engineering, Sizes(Dimensions), Anthropometry, Mathematical models, Suspension devices, Ballistic testing, Standoff

IDENTIFIERS: M-1 helmets, Comfort, NTISDODXA, NTISDODA

AD-A026 065/3ST NTIS Prices: PC\$3.50/MF\$2.25

Muscular Strength of Women and Men: A Comparative Study

Dayton Univ Ohio Research Inst*Aerospace Medical Research Lab.,
Wright-Patterson AFB, Ohio. (105400)

Final rept.

AUTHOR: Laubach, Lloyd L.

C6794L3 FLD: 6P, 573*, 57A GRAI7616

May 76 115p

CONTRACT: F33615-74-C-5116

PROJECT: AF-7184

TASK: 718408

MONITOR: AMRL-TR-75-32

ABSTRACT: Experiments were conducted to measure static muscular strength characteristics of women subjects and compare these results with similar data previously reported for males. Twelve measures of static muscular strength, 22 body-size measurements, and the somatotypes of 31 female subjects were investigated. Selected reports in the literature that have dealt with the comparison of static and dynamic muscular strength of women and men are presented and discussed in some detail. The summary descriptive statistics for the strength measures were compared (tabularly and graphically) and percentage differences in strength between women and men reported. An analysis of the range and the average mean percentage difference in muscular strength capabilities is presented. The complete intercorrelation matrix for the 38 variables (including age) obtained in this research is shown.

DESCRIPTORS: *Muscles, *Strength(Physiology), *Females, *Males, Anthropometry, Comparison, Experimental data, Tables(Data), Graphics, Statistical analysis, Methodology, Military research

IDENTIFIERS: Appendices, Characteristics, NTISDODAF

AD-A025 793/1ST NTIS Prices: PC\$5.50/MF\$2.25

A Prediction of Response of the Head and Neck of the U.S. Adult Military Population to Dynamic Impact Acceleration from Selected Dynamic Test Subjects

Michigan Univ Ann Arbor Highway Safety Research Inst*Office of Naval Research, Arlington, Va. (407825)

Annual technical rept. no. 1, Apr 75-Apr 76

AUTHOR: Schneider, L. W., Bowman, B. M., Snyder, R. G., Peck, L. S.

C6794J3 FLD: 6S, 57W GRAI7616

May 76 175p

REPT NO: UM-HSRI-76-10

CONTRACT: N00014-75-C-1077

PROJECT: NR-105-832

MONITOR: 18

ABSTRACT: Physical characteristics of the head and neck were measured on 18 male Navy volunteers who had previously undergone testing on the NAMRL sled facility at Michoud Station, New Orleans. Measurements include 55 standard anthropometric measures, 32 anthropometric measures of the seated subject, three dimensional head and neck range of motion, neck muscle reflex times in response to head jerks, and neck muscle voluntary isometric strength. These latter measurements were taken in both the sagittal and lateral planes. Measurement results were used to establish parameter values for the MVMA-2D Crash Victim Simulator data set in an attempt to reproduce the dynamic response of these volunteers to -Gx sled acceleration at 6 and 15 G's. Procedures used for computing the various parameter values and comparisons between predicted and experimental results are presented. In addition, measurement data for 18-24 year females taken previously have been utilized to predict the dynamic response that would be expected if these subjects were tested at 6 and 15 G's.

DESCRIPTORS: *Biodynamics, *Biomechanics, *Impact acceleration, *Head(Anatomy), *Neck(Anatomy), Anthropometry, Stimuli, Response(Biology), Predictions, Experimental data, Stress(Physiology), Mathematical models, Simulation, Military personnel, Humans

IDENTIFIERS: NTISDODN

AD-A025 785/7ST NTIS Prices: PC\$6.75/MF\$2.25

Paths of Movement for Selected Body Segments During Typical Pilot Tasks

Texas Tech Univ Lubbock Dept of Industrial Engineering* Aerospace Medical Research Lab., Wright-Patterson AFB, Ohio. (400785)

Final rept.

AUTHOR: Ayoub, M. M., Deivanayagam, S., Kennedy, K. W.

C6794G3 PLD: 5H, 5E, 1C, 95D GRAI7616

Mar 76 396p

CONTRACT: F33615-73-C-4307

MONITOR: AMRL-TR-75-111

ABSTRACT: The report describes the geometry of paths of motion for body segments when the hand travels between selected control locations within an aircraft cockpit. The controls selected for this study were the stick, the throttle, the overhead, the panel, the side-arm and the hatch. The control locations (start and end points of the hand travel) were selected to represent both conventional and high acceleration type aircraft cockpits. In addition three different seat back rest angles (13, 30 and 65 degrees) were employed to represent the conventional and high acceleration seat configurations. To adequately describe the movements of all body segments, the following landmarks on the body were studied using photogrammetric techniques: Nasion, Cervicale, Suprasternale, Acromion, Shoulder joint center, Elbow joint center, Wrist center, Grip center and Greater Trochanter.

DESCRIPTORS: *Man machine systems, *Pilots, *Biomechanics, *Ergonomics, Bodies, Anthropometry, Humans, Human factors engineering, Tables(Data), Control knobs, Control panels, Aircraft, Photogrammetry, Motion, Operators(Personnel), Aviation personnel

IDENTIFIERS: Appendices, *Kinesiology, NTISDODAF

AD-A025 773/3ST NTIS Prices: PC\$10.75/MF\$2.25

Statistical Concepts in Design

Webb Associates Inc Yellow Springs Ohio (401286)

Technical rept.

AUTHOR: McConville, John T., Churchill, Edmund
C6794B1 FLD: 6N, 95D GRAI7616

May 76 57p

CONTRACT: F33615-75-C-5003

PROJECT: AF-7184

TASK: 718408

MONITOR: AMRL-TE-76-29

ABSTRACT: In seeking a manageable way to deal with variations for a large range of body sizes, it is a common practice for designers to construct drafting board manikins, three-dimensional forms or computer simulations as human analogues. Often these analogues are based upon 5th, 50th, or 95th percentile values. Limitations of this approach are discussed in this paper which demonstrate fallacies underlying the assumptions that (1) the proportionality of various individuals is the same and (2) percentiles for body dimensions are additive. Focusing on the 5th and 95th percentile body forms where deviations in size and proportionality are most severe, the report recommends an improved approach to portray the body size of these segments of the population in design problems. A statistical analysis is made of the tails of the height-weight distribution to demonstrate the usefulness of subgroups or regression values.

DESCRIPTORS: *Anthropometry, Human factors engineering, Models, Body weight, Statistical analysis, Statistical distributions, Simulation, Measurement, Flight crews

IDENTIFIERS: NTISDODXA, NTISDODAF

AD-A025 750/1ST NTIS Prices: PC\$4.50/MF\$2.25

Human Performance Under Acceleration: Actuation of Ejection Seat Lower Firing Control

Naval Air Development Center Warminster Pa Crew Systems Dept (406610)

Final rept. 9 Dec 74-30 Jun 75

AUTHOR: Orrick, William P. Jr, York, Phyllis E., Cohen, Malcolm M.

C6781E1 FLD: 1B, 5E, 51C GRAI7616

18 Mar 76 44p

REPT NO: NADC-75268-40

MONITOR: 18

ABSTRACT: Sixteen male subjects attempted to actuate the lower firing control of an ejection seat using only the left hand while exposed to accelerations simulating several flight conditions. A human centrifuge was used to produce accelerations representative of level flight, dive recovery, dive recovery with buffet, cold catapult stroke, braking, inverted flight, spin and skid. In addition, fifty-four male and eight female subjects performed the task at 1 Gz, using three methods of gripping the firing control. Sample data and population estimates of pull forces for the various conditions are presented. Time data for task performance under acceleration and anthropometric data and force data are given. (Author)

DESCRIPTORS: *Ejection seats, *Acceleration, *Human factors engineering, Performance(Human), Time, Pull, Actuation, Males, Females, Anthropometry

IDENTIFIERS: NTISDODXA, NTISDODN

AD-A025 373/2ST NTIS Prices: PC\$4.00/MF\$2.25

Concept Design and Alternate Arrangements of Orbiter Mid-Deck
Habitability Features

Nelson and Johnson Engineering, Inc., Boulder, Colo.

Final Report.

AUTHOR: Church, R. A., Ciciora, J. A., Porter, K. L., Stevenson, G. E.

C6752K4 FLD: 05E, 95D, 84A STAR1410

30 Jan 76 210p

REPT NO: NASA-CR-147495

CONTRACT: NAS9-14686

MONITOR: 18

ABSTRACT: The evaluations and recommendations for habitability features in the space shuttle orbiter mid-deck are summarized. The orbiter mission plans, the mid-deck dimensions and baseline arrangements along with crew compliments and typical activities were defined. Female and male anthropometric data based on zero-g operations were also defined. Evaluations of baseline and alternate feasible concepts provided several recommendations which are discussed. (Author)

DESCRIPTORS: *Habitability, *Human factors engineering, *Space shuttle orbiters, Anthropometry, Design analysis, Mission planning, Size (Dimensions), Weightlessness

IDENTIFIERS: NTISNASA

N76-19815/9ST NTIS Prices: PC\$7.75/MF\$2.25

Exoskeleton Prototype Project

General Electric CO Schenectady N Y Research and Development Center
(149 440)

Final rept. on phase 1
AUTHOR: Gilbert, Kendall E.
C6722J3 FLD: 5H, 5E GRAI7615
28 Oct 66 72p
REPT NO: S-67-1011
CONTRACT: N00014-66-C-0051
PROJECT: NR-169-049, DA-IM6241010507
TASK: IM624101050702
MONITOR: 18
Distribution limitation now removed.

ABSTRACT: This is the final report of Phase I of a three-phase project to develop a powered exoskeleton. This is a powered, jointed, loadbearing structure designed to be worn by man and augment his strength and endurance. While wearing the device, an operator will be able to lift up to 1500 pounds as high as 6 feet. He will also be able to carry such a load at least 25 feet in 10 seconds at any height up to 6 feet. Typical applications for the powered exoskeleton will include loading and unloading cargo from vehicle to ground and vice versa, stacking and moving cargo from place to place, and similar associated tasks. The exoskeleton will be designed so that the wearer can walk, bend, turn, etc., with minimum restraint. (Author)

DESCRIPTORS: (*Human factors engineering, Man machine systems), (*Man machine systems, Feasibility studies), Hydraulic servomechanisms, Cybernetics, Anthropometry, Joints, Handling, Mobility, Range (Distance), Configuration, Posture (Physiology), Safety, Errors, Velocity, Kinematics, Servomotors, Control, Hydraulic actuators, Design, Force (Mechanics), Motion, Attachment, Models (Simulations), Hydraulic equipment, Performance (Engineering)

IDENTIFIERS: Exoskeletons, Slave devices, NTISDODXD

AD-807 467/6ST NTIS Prices: PC\$4.50/MF\$2.25

Sampling and Data Gathering Strategies for Future USAF Anthropometry

Webb Associates Inc Yellow Springs Ohio (401286)

Final rept.

AUTHOR: Churchill, Edmund, McConville, John T.

C6713H3 PLD: 6E, 12A, 95D GRAI7615

Feb 76 142p

CONTRACT: F33615-73-C-4066

PROJECT: AF-7184

TASK: 718408

MONITOR: AMRL-TR-74-102

ABSTRACT: Beginning with a comprehensive review of anthropometric resources already available, this report serves as a guide to more refined and less costly methods of acquiring needed anthropometric data to meet changing military requirements and to accommodate changing military populations. Many sampling schemes are described and evaluated for their utility in meeting specific USAF needs. Various measurement and sampling errors are discussed and the effects of each type of error on the statistics of major importance in design problems are explained. A multi-faceted plan for the future acquisition of USAF anthropometric data is recommended.

DESCRIPTORS: *Anthropometry, Sampling, Statistical analysis, Military requirements, Transients, Data acquisition, Statistical samples, Measurement, Regression analysis, Human body, Error analysis, Body weight

IDENTIFIERS: NTISDODXA, NTISDODAF

AD-A025 240/3ST NTIS Prices: PC\$6.00/MF\$2.25

Test of Vehicle Seating Reference Using the SAE J826b H-Point Machine

American Testing Inst., Springfield, Va.*National Highway Traffic
Safety Administration, Washington, D.C.

Final rept. Jan-Dec 75.

C6664E3 FLD: 13F, C5E, 85B, 95D GRAI7614

Apr 76 96p

CONTRACT: DOT-HS-5-01140

MONITOR: DOT-HS-801-891

ABSTRACT: SAE J826b Hip-Point machine installation procedures were selected as those showing the least variability of Hip-Point location from repeated installations. The variability of a vehicle SRP to the Hip-Point as determined by machine installation was found to be described by a rectangle with limits of 2 inches horizontally by 1 inch vertically.

DESCRIPTORS: *Automotive engineering, *Human factors engineering, *Seats, Tests, Test equipment, Experimental data, Anthropometry, Variability, Selection, Installing, Specialized training, Methodology, Data processing, Recommendations, Machine design

IDENTIFIERS: Seating reference points, Hip point machines, NTISDOTHTS

FB-252 122/7ST NTIS Prices: PC\$5.00/MF\$2.25

Functional Strength of Commercial Airline Stewardesses

Federal Aviation Administration Washington D C Office of Aviation
Medicine (264320)

AUTHOR: Reynolds, Herbert M., Allgood, Mackie A.

C6175L4 FLD: 6P, 57S GRAI7609

Nov 75 15p

REPT NO: FAA-AM-75-13

PROJECT: FAA-AM-B-73-PRS-48

MONITOR: 18

ABSTRACT: Data from 13 body measurements and 4 strength tests on 152 female flight attendants are reported herein. The stewardesses are taller (\bar{x} = 165.8 cm) and lighter (\bar{x} = 54.6 kg) than the corresponding age in the civilian population. The strength tests are reported as the average plateau, maximum force, and pound-second force for a two-handed push (110 cm from floor), leg lift (25 cm from floor), back lift (50 cm from floor), and arm lift (100 cm from floor). There are no comparable data in the literature; thus, these data can provide a general guideline as to the maximum strength capabilities of the on-line airline stewardess.

DESCRIPTORS: *Strength(Physiology), *Aviation medicine, Anthropometry, Human factors engineering, Civil aviation, Females

IDENTIFIERS: *Stewardess, NTISDODFAA, NTISDOTFAA

AD-AC21 836/2ST NTIS Prices: PC\$3.50/MF\$2.25

Development and Evaluation of Masterbody Forms for Three-Year Old and Six-Year Old Child Dummies

Michigan Univ., Ann Arbor. Highway Safety Research Inst.*National Highway Traffic Safety Administration, Washington, D.C.*Civil Aeromedical Inst., Oklahoma City, Okla.*Webb Associates, Inc., Yellow Springs, Ohio. (407 825)

Final rept. Oct 74-Jul 75

AUTHOR: Reynolds, H. M., Young, J. W., McConville, J. T., Snyder, R. G.

C6102F4 FLD: 06N, 13B, 95D, 85D, 57A GRAI7608

Jan 76 110p

CONTRACT: NHTSA-5-1494

MONITOR: DOT-HS-801-811

Prepared in cooperation with Civil Aeromedical Inst., Oklahoma City, Okla. and Webb Associates, Inc., Yellow Springs, Ohio.

ABSTRACT: A study was undertaken to define, construct, measure and evaluate the size, shape and mass distribution of masterbody forms representative of 3-year old and 6-year old United States children. The authors' best collective judgment defined a list of 98 anthropometric dimensions which were to be used to construct clay masterbody phantom. These phantoms were constructed using dimensional data abstracted from the available literature. The clay phantoms were sculptured and then reproduced exactly in dental stone. The dental stone casts were segmented into 10 body segments representing the head, neck, upper torso, lower torso, upper arm, lower arm, hand, upper leg, lower leg, and foot. Data derived from the measurement of weight, volume, center of mass and mass moments of inertia on each of the resulting body segments are presented.

DESCRIPTORS: *Anthropometry, *Anatomical models, *Traffic safety, *Highway transportation, Measurement, Children, Model tests, Weight(Mass)

IDENTIFIERS: DOT/4FZ/FY, DOI/5H, NTISDOTHTS

PB-249 294/0ST NTIS Prices: PC\$5.50/MF\$2.25

Programmable Anthropomorphic Articulation

Department of Transportation, Washington, D.C. (403 753)

Patent Application

AUTHOR: Haffner, Mark P., Pizer, Robert S.

C5945L3 FLD: C6L, 95A, 90D GRAI7606

Filed 7 Jan 76 19p

REPT NO: PAT-APPL-647 317, DOT/Case-TSC-N-10003

MONITOR: 18

Government-owned invention available for licensing. Copy of application available NTIS.

ABSTRACT: The invention is an anthropomorphic programmable joint which joins two limb portions. The joint may simulate the knee joint and the portions may correspond to the upper and lower leg portions about the knee. A magnetic particle brake is attached to the upper portion with a shaft that carries the pinion gear of a bevel gear set located at the joint. The ring gear of the bevel gear set is fixed to the lower limb portion so that rotation of the lower limb portion about the joint caused the shaft to rotate the magnetic brake fixed to the upper portion. The brake resistance to this rotation, and therefore the resistance of the joint to rotation, may be programmed in correspondence to electrical current applied to the brake.

DESCRIPTORS: *Patent applications, *Prosthetic devices, *Artificial limbs, Anthropometry, Joints(Anatomy), Knee(Anatomy), Leg(Anatomy)

IDENTIFIERS: PAT-CL-3-1.1, NTISGPDOT

PB-248 689/2ST NTIS Prices: PC\$3.50/MF\$2.25

Air Bag Restraints (A Bibliography with Abstracts)

National Technical Information Service, Springfield, Va. (391 812)

Rept. for 1964-Jan 76

AUTHOR: Young, Mary E.

C5853H1 PLD: 13F, 13L, 85D*, 95D*, 86W GRAI7605

Jan 76 90p*

MONITOR: 18

Supersedes NTIS/PS-75/130.

ABSTRACT: Inflatable restraints used as safety devices in motor vehicles are described in reports abstracted in the bibliography. The feasibility, development, and testing of the devices for both standard and compact cars are included. (This updated bibliography contains 85 abstracts, 17 of which are new entries to the previous edition.)

DESCRIPTORS: *Inflatable structures, *Bibliographies, *Safety devices, Safety belts, Automobiles, Motor vehicles, Passenger vehicles, Safety engineering, Protection, Anthropometry, Human factors engineering, Collision research

IDENTIFIERS: *Air bag restraint systems, NTISNTIS

NTIS/PS-76/0024/CST NTIS Prices: PC\$25.00/MF\$25.00

Bioengineering Study of Basic Physical Measurements Related to
Susceptibility to Cervical Hyperextension-Hyperflexion Injury

Michigan Univ., Ann Arbor. Highway Safety Research Inst.*Insurance
Inst. for Highway Safety, Washington, D.C. (407 825)

Final rept. 15 Jan 72-15 Sep 73

AUTHOR: Snyder, Richard G., Chaffin, Don B., Foust, David P.

C5315K2 FLD: 06S, 13L, 57W, 85D GRAI7604

Sep 75 323p

REPT NO: UM-HSRI-BI-75-6

PROJECT: ORA-72-613-B1

MONITOR: 18

ABSTRACT: Basic physical characteristics of the neck which may influence a person's susceptibility to 'whiplash' injury during rear-end collisions have been defined using 180 human volunteer subjects chosen, on the basis of sex, age (18-74 years), and stature, to be representative of the U.S. adult population. Measurements from each subject included anthropometry, cervical range of motion from both x-rays and photographs, and the dynamic response and isometric strength of the neck flexor and extensor muscles. Summary data for key measurements are discussed in the text; complete summaries for each measure are in four appendices. The results were used to develop a method of predicting dynamic muscle force from isometric EMG data, and to examine injury susceptibility for various population groups using a bio-mechanical model. Portions of this document are not fully legible.

DESCRIPTORS: *Neck(Anatomy), *Impact shock, *Biodynamics, Anatomical models, Anthropometry, Muscles, Injuries, Tolerances(Physiology), Responses, Sex, Aging(Biology), Humans, Motor vehicle accidents

IDENTIFIERS: *Biomechanics, *Whiplash injury, DOT/5A, DOT/5H, Rear end collisions, NTISHSRI

PB-247 763/6ST NTIS Prices: PC\$9.75/MF\$2.25

Investigation of the Performance of Personal Flotation Devices

Underwriters' Labs Inc Tampa Fla*See also report dated 31 Mar 70, AD-708 188.*Coast Guard, Washington, D.C. Office of Research and Development. (409487)

Final rept.

C5573C1 FLD: 6G, 13J, 13L, 5K, 95D, 47A, 91I, 85D GRAI7601

Aug 75 129p

CONTRACT: DOT-CG-25112-A

MONITOR: USCG-D-168-75

ABSTRACT: An experimental investigation was performed to study various aspects of an existing theory for flotation equilibrium angle of a person wearing a personal flotation device (PFD) in water. The major objectives were determination of the validity of the theory, and derivation of a method for determining the buoyant force and center of buoyancy of a PFD when worn by a person. Additionally, information was obtained on the sensitivity of the theory to small changes in variables, the variability of repetitive measurements of certain human-body characteristics required by the theory (namely, lung vector and intrinsic stiffness vector), the variation with time of day of an individual's intrinsic stiffness vector, and the comparative effectiveness of five PFD's. The experiments used eight human subjects (130-240 lbs. in weight), five PFD's, and five different times of day. Because of the small number of experiments used, the statistical significance of some results is limited. A recommended approach to evaluating PFD effectiveness using experiments with mannequins is described.

DESCRIPTORS: *Life jackets, *Floats, *Buoyancy, Human factors engineering, Test methods, Reliability, Safety, Equilibrium(General), Theory, Effectiveness, Coast Guard, Life saving, Life preservers, Anthropometry, Computer programs

IDENTIFIERS: *PFD(Personal Flotation Devices), *Personal flotation devices, DOT/5A, DOT/4ZZ, Recreational boating, NTISDODCG, NTISDOTCG

AD-AC17 101/7ST NTIS Prices: PCS6.00/MF\$2.25

Anthropometry of Law Enforcement Officers

Naval Electronics Lab Center San Diego Calif*National Bureau of Standards, Washington, D.C. Law Enforcement Standards Lab. (403940)

AUTHOR: Martin, James I., Sabeh, Raymond, Driver, Lewis L., Lowe, Terry D., Hintze, Roger W.

C5572F2 FLD: 6Q, 5E, 57A, 95D* GRAI7601

10 Sep 75 252p

REPT NO: NELC/TD-442

PROJECT: NELC-N530

MONITOR: 18

ABSTRACT: A measurement survey of 23 body dimensions critical to the design and sizing of protective equipment was made of approximately 3,000 male law enforcement officers. The anthropometric data were collected in 17 regions throughout the United States. Data on the key factors of height, weight, and age of an additional 10,000 officers were also obtained. The information from these two measurement surveys has been encoded for computer-processing. This report presents the results of standard anthropometric statistical treatments of the data. The information contained in this report and in the anthropometric data bank developed by the project may be used to improve the design and sizing of equipment for law enforcement populations. Matched sampling techniques assure the utility of this information for present and future law enforcement populations as well as for the civilian and military communities.

DESCRIPTORS: *Physiology, *Anthropometry, *Law enforcement officers, *Human factors engineering, Anatomy, Sizes (Dimensions), Measurement, Data bases, Test methods, Protective equipment, Measuring instruments, Experimental design, Small arms, Statistical data, Surveys

IDENTIFIERS: NTISDODN, NTISCOMNBS

AD-A017 066/2ST NTIS Prices: PC\$9.00/MF\$2.25

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